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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,641	07/02/2003	Timothy P. McCaffrey	130954	4619

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EXAMINER	
KIM, TAE JUN	

ART UNIT	PAPER NUMBER
3746	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/613,641	MCCAFFREY ET AL.	
	Examiner	Art Unit	
	Ted Kim	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 04 May 2005.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 7-20 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 05/04/2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed 07/29/2003 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Both alternative embodiments added to the specification by underlining were not originally disclosed. Moreover, the added element numbers "35", "29" and "31" were improperly done as they lack the appropriate underlining.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Kraft et al (6,446,439). Kraft et al teach a primer nozzle for a gas turbine engine combustor including a centerline axis, said primer/pilot nozzle 39 (Fig. 4) or 206, 216 (Figs. 9-11) comprising: an inlet 250 and 120 coupled to a source of pressurized air (see air in Fig. 9 radially outwardly of 250); an injection tip for discharging fuel into said combustor in a direction that is substantially parallel to the gas turbine engine centerline axis; a body

extending between said inlet and said injection tip, said body comprising at least one annular projection (e.g. 120, Fig. 2) for coupling said nozzle to said body such that said primer nozzle is positioned relative to the combustor; and a shroud 170 (Fig. 4) or 208 (Figs. 9-11) extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings (226, Figs. 9-11 and unlabeled in Fig. 4) for metering cooling air supplied to said injection tip.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 13, 15-17, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturgess (3,866,413) in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Sturgess teaches a combustion system for a gas turbine engine, said combustion system comprising: a combustor comprising a dome assembly including dome 37 and a combustor liner 5 extending downstream from said dome assembly, said combustor liner defining a combustion chamber therein, said combustor further comprising a centerline axis; a combustor casing 3 extending around said combustor; and

a primer/pilot nozzle 12 extending axially through said combustor casing and said dome assembly for supplying fuel into said combustor along said combustor centerline axis during engine start-up operating conditions; primer nozzle comprises an annular shoulder (either the bolted portion of 2 or the next stepped portion downstream) and positioned relative to said combustor casing by said shoulder; wherein said primer nozzle 12 comprises an injection tip, an inlet 8, and a body extending therebetween, said injection tip for discharging fuel into said combustor in a direction that is substantially parallel to said combustor centerline axis; wherein said primer nozzle comprises an injection tip, an inlet, a body extending between said tip and inlet, and a shroud 15 extending circumferentially around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip. Sturgess does not teach a pressurized air source/accumulator coupled to the inlet for purging residual fuel. Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110 coupled to the inlet for purging residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a pressurized air source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

6. Claims 13, 15-18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dodds (6,530,223) in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Dodds teaches a combustion system for a gas turbine engine, said

combustion system comprising: a combustor comprising a dome assembly including pilot dome 18 and a combustor liner 14, 16 extending downstream from said dome assembly, said combustor liner defining a combustion chamber therein, said combustor further comprising a centerline axis; a combustor casing extending around said combustor; and a primer/pilot nozzle 46 extending axially through said combustor casing and said dome assembly for supplying fuel into said combustor along said combustor centerline axis during engine start-up operating conditions; wherein said primer nozzle comprises an annular shoulder 110, said primer nozzle positioned relative to said combustor casing by said shoulder 110; wherein said primer nozzle comprises an injection tip108, 119, an inlet 114, and a body extending therebetween, said injection tip for discharging fuel into said combustor in a direction (see 98) that is substantially parallel to said combustor centerline axis 12; wherein said primer nozzle comprises an injection tip, an inlet, a body extending between said tip and inlet, and a shroud 138, 140 extending circumferentially around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip; wherein said shroud comprises a plurality of circumferentially-spaced metering openings 130 extending therethrough, said metering openings 130 for metering a flow of cooling air 132 to said injection tip. Dodds does not teach a pressurized air source/accumulator coupled to the inlet for purging residual fuel. Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110 coupled to the inlet for purging

residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a pressurized air source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

7. Claims 13, 15, 16, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orchard et al (3,034,297) in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Orchard et al teach a combustion system for a gas turbine engine, said combustion system comprising: a combustor comprising a dome assembly 32 and a combustor liner 23, 42extending downstream from said dome assembly, said combustor liner defining a combustion chamber therein, said combustor further comprising a centerline axis; a combustor casing extending around said combustor; and a primer/pilot nozzle 34 extending axially through said combustor casing and said dome assembly for supplying fuel into said combustor along said combustor centerline axis during engine start-up operating conditions; wherein said primer nozzle comprises an annular shoulder (between the two sets of dashed lines for the fuel nozzle), said primer nozzle positioned relative to said combustor casing by said shoulder; wherein said primer nozzle comprises an injection tip, an inlet, and a body extending therebetween, said injection tip for discharging fuel into said combustor in a direction that is substantially parallel to said combustor centerline axis. Orchard et al do not teach a pressurized air source/accumulator coupled to the inlet for purging residual fuel. Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110

coupled to the inlet for purging residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a pressurized air source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

8. Claims 7, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kraft et al (6,446,439) in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Kraft et al teach a primer nozzle for a gas turbine engine combustor including a centerline axis, said primer/pilot nozzle 39 (Fig. 4) or 206, 216 (Figs. 9-11) comprising: an inlet 250; an injection tip for discharging fuel into said combustor in a direction that is substantially parallel to the gas turbine engine centerline axis; a body extending between said inlet and said injection tip, said body comprising at least one annular projection (e.g. 120, Fig. 2) for coupling said nozzle to said body such that said primer nozzle is positioned relative to the combustor; and a shroud 170 (Fig. 4) or 208 (Figs. 9-11) extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings (226, Figs. 9-11 and unlabeled in Fig. 4) for metering cooling air supplied to said injection tip. Kraft et al do not teach a pressurized air source/accumulator coupled to the FUEL inlet for purging residual fuel. Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110 coupled to the inlet for purging residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a

pressurized air source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

9. Claims 13, 15-16, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lefebvre (3,283,502) in view of either Harper et al (4,041,695) or Davies et al (3,344,602). Lefebvre teaches a combustion system for a gas turbine engine, said combustion system comprising: a combustor comprising a dome assembly 8 and a combustor liner 2 extending downstream from said dome assembly, said combustor liner defining a combustion chamber therein, said combustor further comprising a centerline axis; a combustor casing 1 extending around said combustor; and a primer nozzle 10 extending axially through said combustor casing and said dome assembly for supplying fuel into said combustor along said combustor centerline axis during engine start-up operating conditions; wherein said primer nozzle comprises an annular shoulder (see Fig. 1), said primer nozzle positioned relative to said combustor casing by said shoulder; wherein said primer nozzle comprises an injection tip 21, an inlet, and a body extending therebetween, said injection tip for discharging fuel into said combustor in a direction that is substantially parallel to said combustor centerline axis. Lefebvre do not teach a pressurized air source/accumulator coupled to the inlet for purging residual fuel. Harper teaches using a pressurized air source/accumulator 82 coupled to the inlet for purging residual fuel during predetermined conditions (see abstract). Davies et al teach an air accumulator 110 coupled to the inlet for purging residual fuel from the fuel nozzles. It would have been obvious to one of ordinary skill in the art to employ a pressurized air

source/accumulator to reduce coking of the fuel injector and/or to expel all the fuel during shutdown.

10. Claims 7, 8, 10-13, 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lefebvre (3,283,502) in view of either Harper et al (4,041,695) or Davies et al (3,344,602), as applied above, and further in view of any of Faucher et al (4,362,022), Donlan (5,361,578) and Weiler (4,229,944). Lefebvre further teach a primer nozzle 10 for a gas turbine engine combustor including a centerline axis, said primer nozzle comprising: an inlet; an injection tip for discharging fuel into said combustor in a direction that is substantially parallel to the gas turbine engine centerline axis; a body extending between said inlet and said injection tip, said body comprising at least one annular projection for coupling said nozzle to said body such that said primer nozzle is positioned relative to the combustor; said primer nozzle configured to supply fuel to the gas turbine engine combustor only during engine start-up operating conditions (col. 4, lines 17+). Lefebvre does not teach a shroud for cooling the primer nozzle. Faucher et al teach a shroud 22 extending around an injection tip 20 and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings for metering cooling air 30 supplied to said injection tip; wherein said shroud further comprises a frustroconical shroud tip extending around said frusto-conical injection tip, said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. The cooling of the injector tip allows for

reduced coking of the fuel nozzle. Donlan teaches a shroud 24 or 42 extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings for metering cooling air 39, 40 supplied to said injection tip wherein said shroud further comprises a frustroconical shroud tip extending around said injection tip; wherein said shroud plurality of circumferentially-spaced openings 39, 40 facilitate limiting an airflow therethrough if said shroud tip deteriorates. Donlan also teaches the cooling air and shroud prevents coking (col. 3, lines 58+). Weiler teaches a shroud extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud 17 comprising a plurality of circumferentially-spaced openings 7, 8 for metering cooling air supplied to said injection tip; wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip comprising a plurality of cooling openings 25, wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip is frusto-conical; wherein said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. It would have been obvious to one of ordinary skill in the art to employ a shroud and cooling air, as taught by any of Faucher et al, Donlan et al, and Weiler, in order to prevent coking/carbonizing of the nozzles.

11. Claims 7, 8, 10-13, 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sturgess (3,866,413) in view of either Harper et al (4,041,695) or Davies et al (3,344,602), as applied above, and further in view of any of Faucher et al (4,362,022), Donlan (5,361,578) and Weiler (4,229,944). Sturgess teaches various aspects of the claimed invention but does not teach a shroud with circumferential air openings surrounding the primer/pilot nozzle 12. Faucher et al teach a shroud 22 extending around an injection tip 20 and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings for metering cooling air 30 supplied to said injection tip; wherein said shroud further comprises a frustroconical shroud tip extending around said frusto-conical injection tip, said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. The cooling of the injector tip allows for reduced coking of the fuel nozzle. Donlan teaches a shroud 24 or 42 extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud comprising a plurality of circumferentially-spaced openings for metering cooling air 39, 40 supplied to said injection tip wherein said shroud further comprises a frustroconical shroud tip extending around said injection tip; wherein said shroud plurality of circumferentially-spaced openings 39, 40 facilitate limiting an airflow therethrough if said shroud tip deteriorates. Donlan also teaches the cooling air and shroud prevents coking (col. 3, lines 58+).

Weiler teaches a shroud extending around said injection tip and around at least a portion of said body such that a gap is defined between said shroud and at least one of said body and said injection tip, said shroud 17 comprising a plurality of circumferentially-spaced openings 7, 8 for metering cooling air supplied to said injection tip; wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip comprising a plurality of cooling openings 25, wherein said shroud further comprises a shroud tip extending around said injection tip, said shroud tip is frusto-conical; wherein said shroud plurality of circumferentially-spaced openings facilitate limiting an airflow therethrough if said shroud tip deteriorates. It would have been obvious to one of ordinary skill in the art to employ an additional shroud and cooling air about the primer/pilot nozzle 12 of Sturgess, as taught by any of Faucher et al, Donlan et al, and Weiler, in order to prevent coking/carbonizing of the nozzle.

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Lefebvre (3,283,502) or Sturgess (3,866,413) in view of either Harper et al (4,041,695) or Davies et al (3,344,602), and in view of any of Faucher et al (4,362,022), Donlan (5,361,578) and Weiler (4,229,944) as applied above, and further in view of either Stuttaford et al (6,675,581) or Bechtel et al (6,363,724). Lefebvre and Sturgess teach various aspects of the claimed invention but do not teach the coolant openings on the shroud tip for film cooling. Lefebvre teaches coolant openings 24 on the shroud tip for film cooling. Sturgess teaches coolant openings 58 on the shroud tip for film cooling. It

would have been obvious to one of ordinary skill in the art to employ coolant openings on the shroud tip in order to provide film cooling thereof.

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over any of the above prior and further in view of either Owner et al (2,529,958) or Dougherty et al (3,116,606). The above prior art do not teach an annular support ring. Owner et al teach an annular support ring comprising a first radial flange 24, a second radial flange 25 axially spaced from said first radial flange, and a plurality of circumferentially- spaced beams 7 extending between said first radial flange and said second radial flange, said combustor casing coupled to said annular support ring. Dougherty et al teach a combustor casing 12 with flanges 14 and adjacent 16 but does not teach a plurality of circumferentially spaced beams. It would have been obvious to one of ordinary skill in the art to employ an annular support ring employ circumferentially spaced beams coupled to the casing, as taught by Owner et al or Dougherty et al, in order to employ a rigid and/or strong and/or easily disassembled assembly.

Response to Arguments

14. Applicant's arguments filed 01/04/2005 have been fully considered but they are not persuasive regarding Kraft et al as Kraft et al specifically disclose an inlet coupled to a source of pressurized air (see Fig. 9).

15. Applicant's central argument is regarding the new limitations added by amendment to the independent claims and dependent claims 12, 20, specifically, the issue of the a pressurized air source/accumulator coupled to the inlet for purging fuel. It is

shown that this is a very well known feature in the art and its presence would have been obvious to do for the reasons set forth above.

16. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.02(l)(3). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 703-872-9306 for Regular faxes and 703-872-9306 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at http://www.uspto.gov/main/patents.htm

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